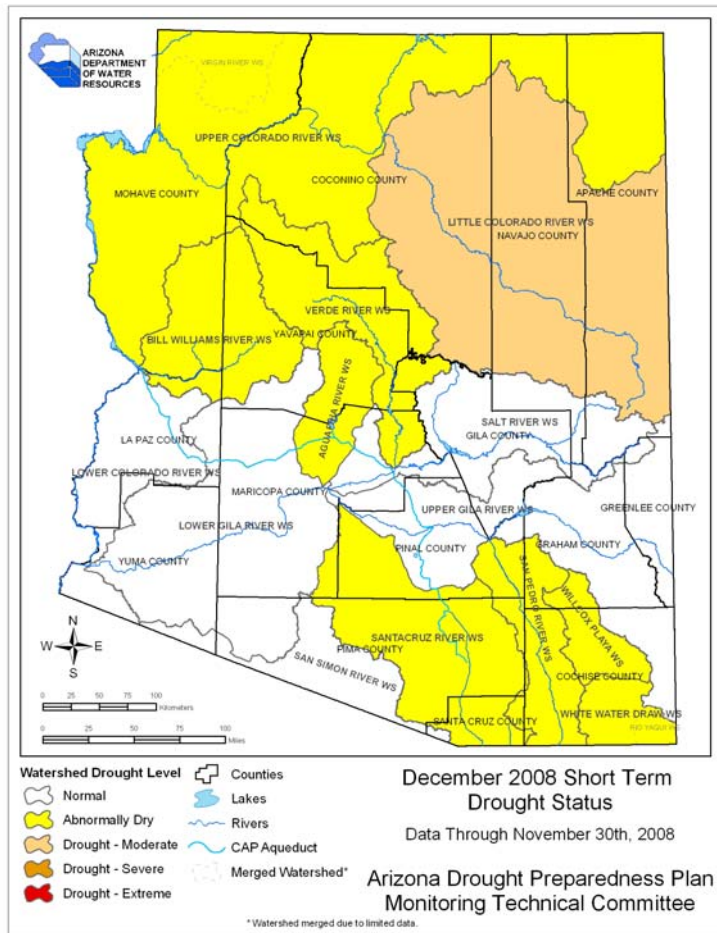
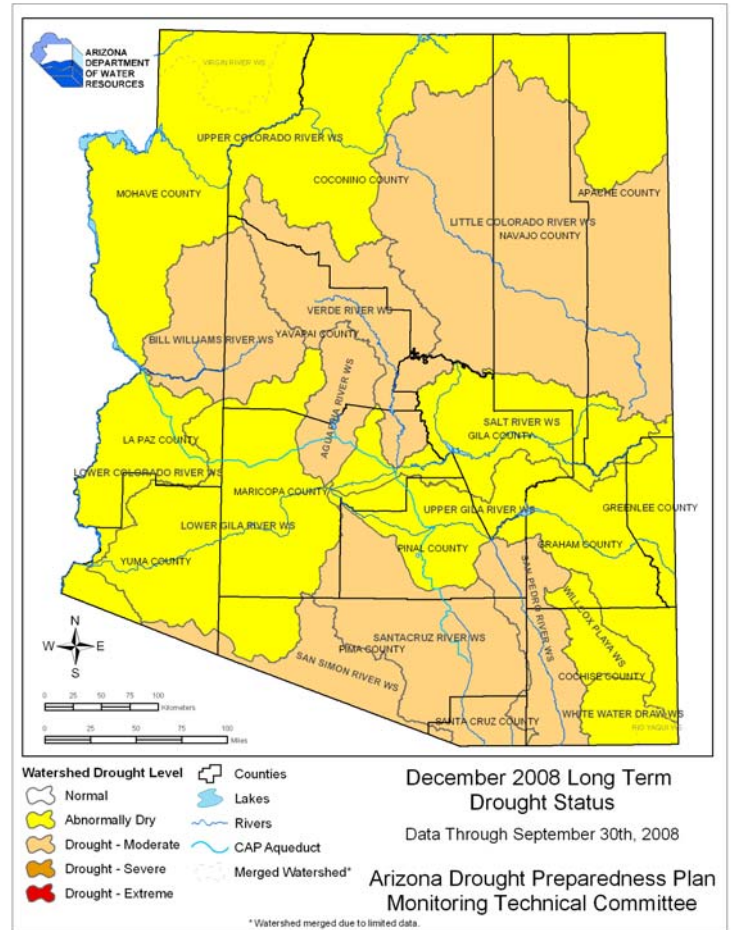


# Arizona Drought Monitor Report December 2008

## Short-term Drought Status



## Long-term Drought Status

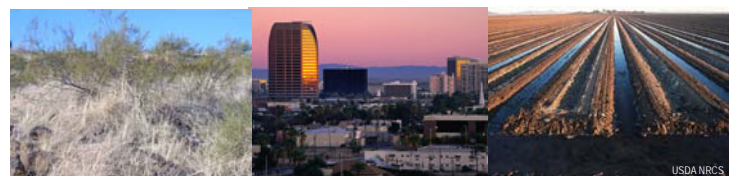


### Short-term Update

The short-term map, which includes precipitation data from the last 12 months, shows improvement in two watersheds, the Agua Fria and Lower Colorado. All other watersheds remain unchanged from last month. Although November precipitation was near or above average over most of Arizona, much of the state shows abnormally dry or moderate drought conditions due to a very dry fall prior to November's storm activity.

### Long-term Update

The long-term drought status will remain unchanged until late January when the October through December data are evaluated for seasonal changes.



# Reservoir Storage

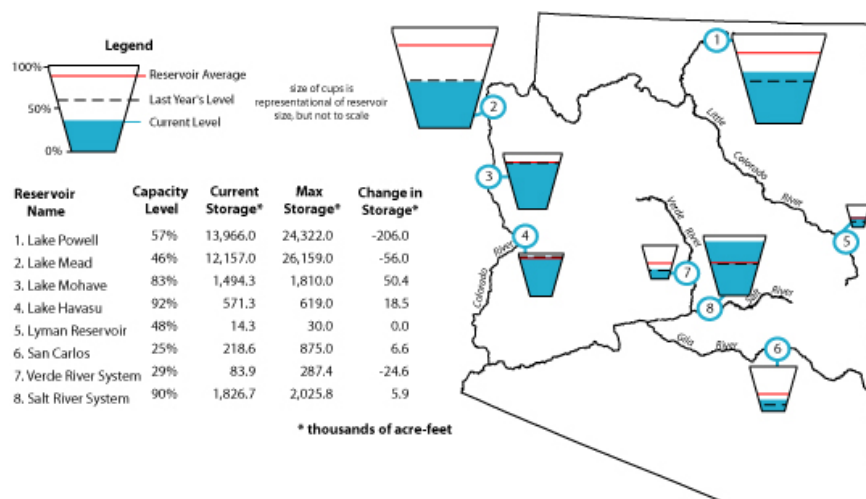


## Arizona Reservoir Status

Combined reservoir storage in Lakes Powell and Mead declined by 262,000 acre-feet during November 2008. Nevertheless, water volumes in these two reservoirs are about two million acre-feet more than they were last year. During November, storage in the Salt River watershed slightly increased, while storage in the Verde River watershed declined approximately 20 percent, or about 25,000 acre-feet.

In Arizona water news, the seven Colorado River Basin states, during their annual meeting in Las Vegas, focused on finding ways to create a sustainable balance between energy production and the use of water needed to generate that energy. The water-energy connection is simple: power plants need water—almost half the nation's annual water use is consumed in the generation of electricity. Managing both water and energy use will be critical for Arizona's sustainable water future. The seven Colorado River Basin states are Arizona, California, Nevada, New Mexico, Utah, Wyoming, and Colorado.

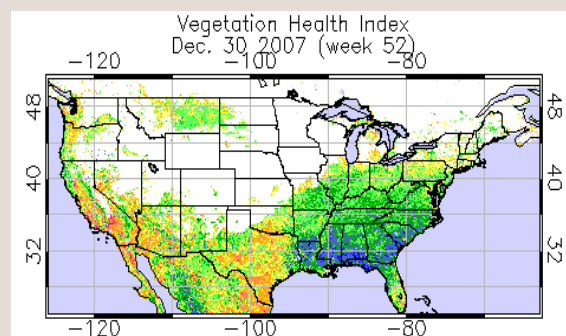
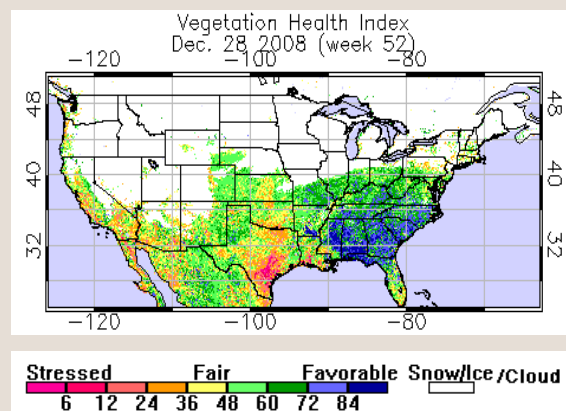
Arizona reservoir levels for November 2008 as a percent of capacity. The map depicts the average level and last year's storage for each reservoir, while the table also lists current and maximum storage levels.



# Vegetation Health



Vegetation health index (VHI) data from the NOAA Center for Satellite Applications and Research (top figure) shows favorable vegetation conditions in the central third of Arizona. During the second half of 2008, a combination of above-average November precipitation and above-average summer precipitation in western Arizona helped improve vegetation conditions. In contrast to one year ago (bottom figure), the current VHI shows more robust vegetation conditions in the central and western parts of the state. At the end of 2007, western Arizona and much of the Mojave Desert in neighboring California exhibited high vegetation stress, associated with extreme drought. White areas in these figures indicate that snow, ice, or clouds were substantial enough to obscure vegetation for a majority of days during which the satellite images were assembled.



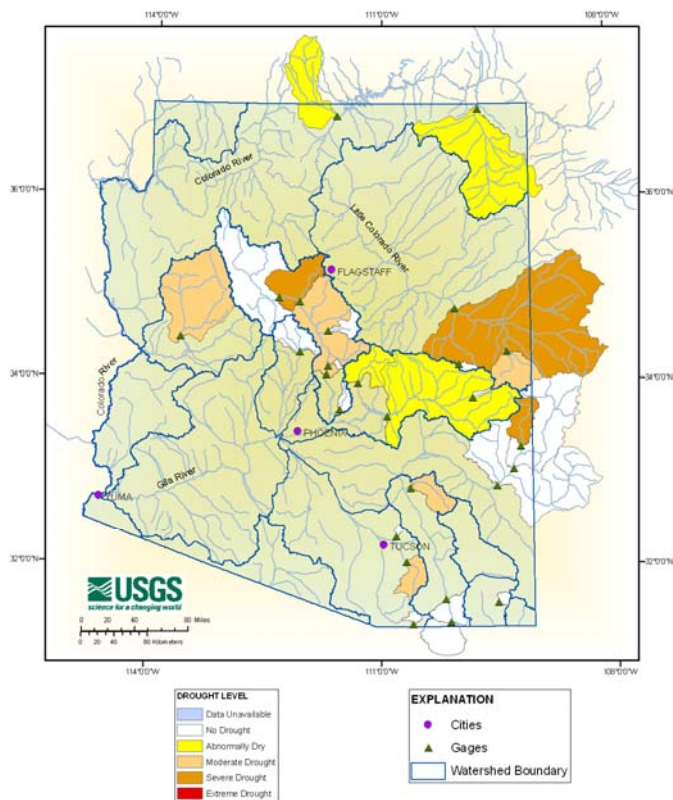


# Mountain Streamflow



## Drought Levels Based on Monthly Streamflow Discharge

November 2008



## November Streamflow

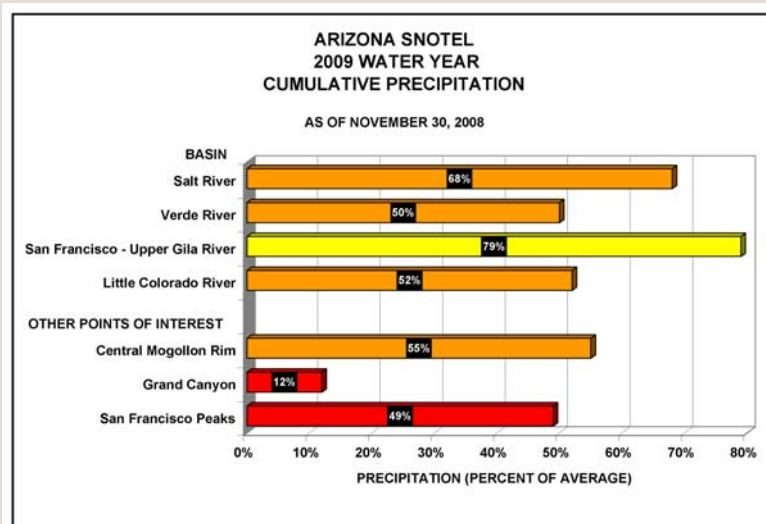
Streamflow increased through parts of the state during the month of November. Precipitation during the Thanksgiving weekend resulted in above average streamflow for several sites. In the central and northern part of the state several basins decreased in drought severity. A few basins increased in severity towards the east. In the southeast one basin increased in severity, one decreased and the others had no change.

Water body	November Run-off in Acre Feet	% of Median
Salt River near Roosevelt	12,972	72%
Tonto Creek above Gun Creek near Roosevelt	559	34%
Verde River at Horseshoe Dam	12,466	79%
Combined Inflow to Salt River Project (SRP) reservoir system	25,997	77%
Little Colorado River above Lyman Lake	190	51%
Gila River to San Carlos Reservoir	7,914	61%

*Streamflow Observed at USGS Gauging Stations*

## Mountain Precipitation

Monitoring stations show below normal to well below normal precipitation amounts occurring during November in Arizona's river basins, ranging from 41% of average in the San Francisco-Upper Gila River Basin to 72% of average in the Verde River Basin. Cumulative precipitation for the 2009 water year (beginning Oct. 1) is also well below average in all basins as the result of a very dry fall prior to November storm activity (see graphic at right).



# Temperature and Precipitation



November precipitation was near average across most of the state, with the central watersheds somewhat wetter than average, and the Santa Cruz and San Simon watersheds in southern Arizona, drier than average. Temperatures were much warmer than average across the state in November. Only during the winter storms did temperatures fall to average or below average values. Temperatures were above the 95<sup>th</sup> percentile on the Colorado Plateau, and above the 83<sup>rd</sup> percentile elsewhere.

The 3-month period, September through November, was much drier than average in all watersheds, except the lower Colorado River, due to an early end to the monsoon activity and a very dry October. The dry conditions kept temperatures above average across the state.

The 6-month period, from June through November, continued to be wetter than average in the southern half of the state, and drier than average in the northern half of the state. The wet conditions in the south are due to the wet monsoon, which did not move into northern Arizona this year. Six month temperatures were much warmer than average, with Maricopa and Pinal counties were above the 98<sup>th</sup> percentile.

The 12-month period continues to be the wettest interval. Only the Virgin watershed is drier than average. Temperatures were slightly

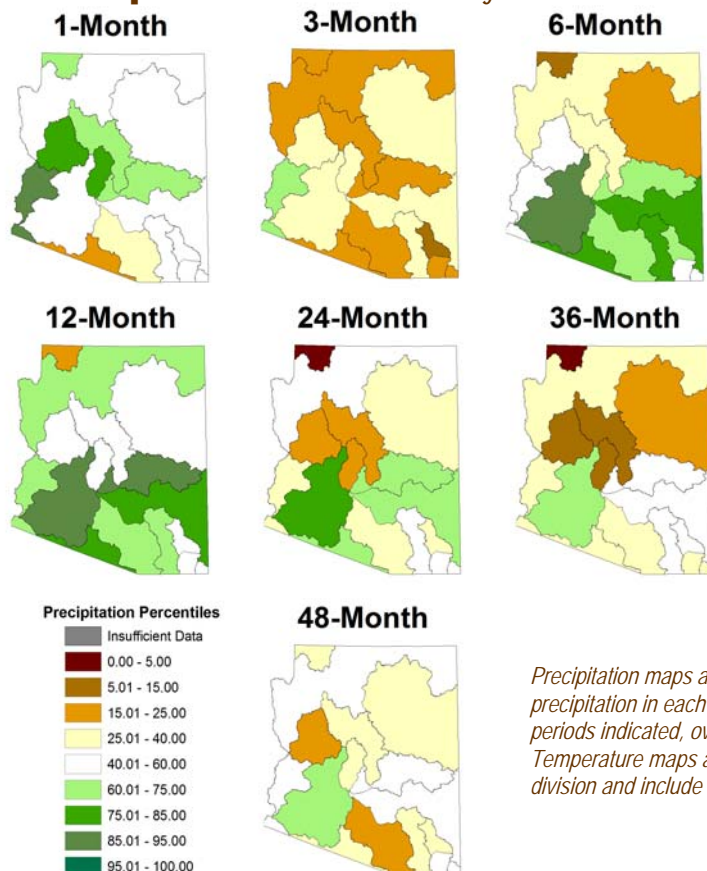
warmer than average in northern Arizona and much warmer than average in southern Arizona.

The 24-month period was variable across the state due to the difference in storm tracks between the winters of 2007 and 2008, and monsoon activity in the summers of 2007 and 2008. Temperatures for the 24-month period are once again above the 75<sup>th</sup> percentile across the state, with the warmest temperatures in Maricopa, Pinal, and the southeastern counties.

The 36-month period remains the driest long term period state-wide, with the driest watersheds in central Arizona. There has been some improvement as there are now four watersheds above the 42<sup>nd</sup> percentile, and only five below the 25<sup>th</sup> percentile. Temperatures are still much warmer than average for the 36-month period, with the southern half of the state the warmest.

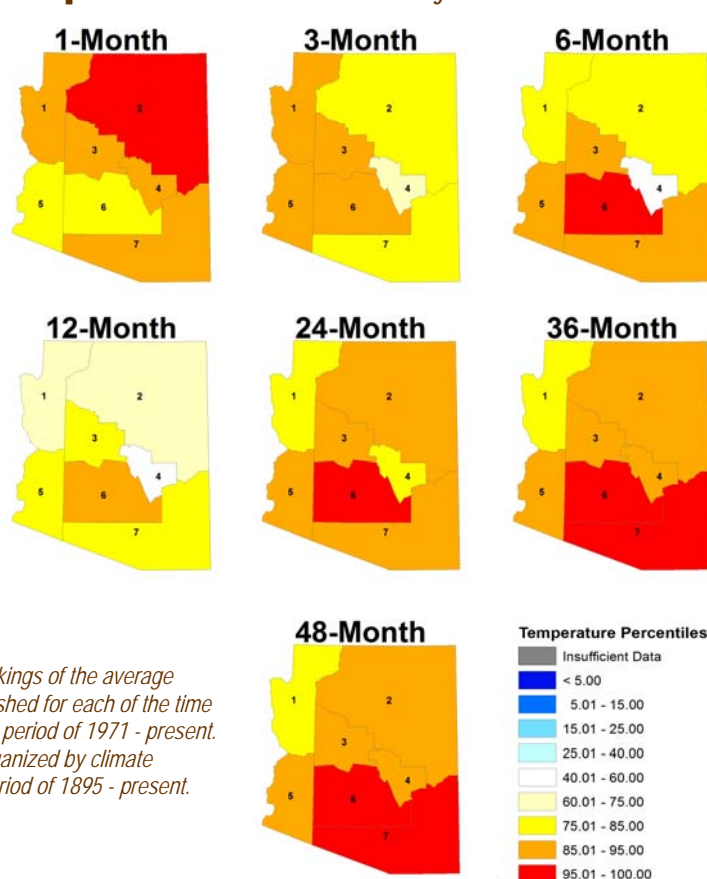
The 48-month period has nine watersheds drier than average, five watersheds near average, and one (lower Gila) wetter than average. The driest watersheds continue to be the Santa Cruz in southeastern Arizona, and the Bill Williams in west central Arizona, both below the 24<sup>th</sup> percentile. The 48-month temperatures are still well above average in all climate divisions, with the southeastern and south central divisions at the 100<sup>th</sup> percentile, the warmest 48-month period since 1895.

## Precipitation Percentiles by Watershed



*Precipitation maps are rankings of the average precipitation in each watershed for each of the time periods indicated, over the period of 1971 - present. Temperature maps are organized by climate division and include the period of 1895 - present.*

## Temperature Percentiles by Climate Division





# Weather Outlook

**Arizona Drought Monitor Report -**  
Produced by the Arizona State Drought  
Monitoring Technical Committee

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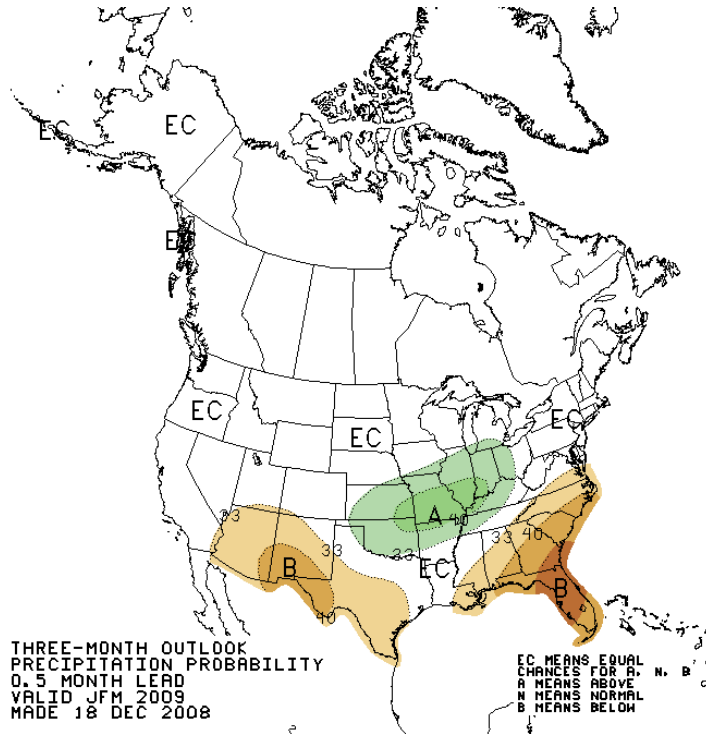
Dino DeSimone, Natural Resources  
Conservation Service

Charlie Ester, Salt River Project

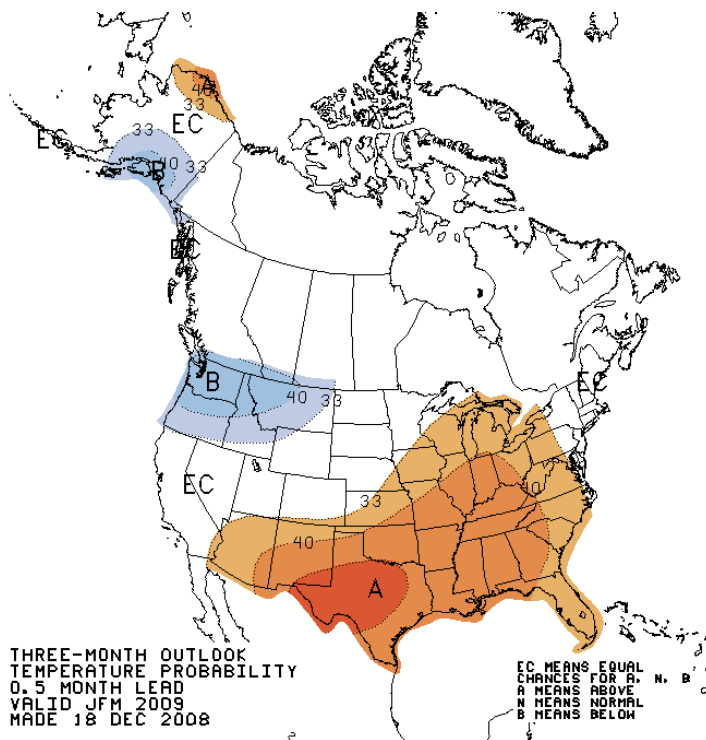
Ron Ridgway, Arizona Division of Emer-  
gency Management

Chris Smith, U.S. Geological Survey

Coordinator: Susan Craig, Arizona  
Department of Water Resources  
Computer Support: Andy Fisher, Arizona  
Department of Water Resources



The CPC Precipitation Outlook for January through March 2009 indicates there is some confidence precipitation will be below-average across the state during the 90-day period.



The CPC Temperature Outlook for January through March 2009 indicates there is some confidence temperatures will be above-average across the state during the 90-day period.